

## CLAIMS

1. A database management system, comprising:  
a processor configured to provide a neighborhood locking scheme for a neighborhood  
5 associated with a data item, the neighborhood locking scheme providing a first locking mode  
for the data item while creating a second locking mode for the neighborhood associated with  
the data item.
2. A database management system according to claim 1 wherein the neighborhood  
10 locking scheme allows a non-serializable scan of the data item with a first transaction while  
allowing a non-serializable lock on the neighborhood with a second transaction.
3. A database management system according to claim 1 wherein the neighborhood  
locking scheme allows a first non-serializable lock on the data item with a first transaction  
15 while concurrently allowing a second non-serializable lock on the neighborhood with a  
second transaction.
4. A database management system according to claim 1 wherein the neighborhood  
corresponds to free space between tuples in a table.
- 20 5. A database management system according to claim 4 wherein the tuples in the table  
are identified through an index.
6. A database management system according to claim 1 wherein the neighborhood  
25 locking scheme includes a neighborhood lock (Xnei) mode that enables a first transaction to  
lock the neighborhood for inserting a new tuple B but prevents the first transaction from  
locking a tuple associated with the neighborhood.
7. A database management system according to claim 6 wherein the Xnei mode enables  
30 a second concurrent transaction to modify the tuple while preventing the second concurrent  
transaction from having exclusive rights on the neighborhood.
8. A database management system according to claim 1 wherein the neighborhood  
locking scheme includes a non-serializable end of scan (Snei) lock mode that allows a first

transaction to only read the neighborhood while preventing the first transaction from reading or writing a tuple associated with the neighborhood.

5 9. A database management system according to claim 8 wherein the Snei lock mode enables a second concurrent transaction to read and write the tuple and modify the data neighborhood.

10 10. A method for controlling access to data items in a database, comprising:  
identifying a neighborhood associated with a data item in the database;  
10 providing a first set of access privileges for the data item; and  
providing a second set of access privileges for the neighborhood associated with the data item.

15 11. A method according to claim 10 including allowing a first transaction to modify the neighborhood while concurrently allowing a second transaction to modify the data item.

12. A method according to claim 11 including preventing the first transaction from locking the data item.

20 13. A method according to claim 11 including gaining access for modifying the neighborhood by asserting a neighborhood lock (Xnei) on the data item.

14. A method according to claim 10 including using entries in an index to identify the neighborhood.

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